



FOREST CONTROL

by

CONTINUOUS INVENTORY

"Today I have grown taller from walking
with the trees."

...Karle Wilson

Milwaukee, Wis. February, 1962 No. 95

"He who knows the most, he who knows what sweets
and virtues are in the ground, the waters, the
plants, the leaves, and how to come at these
enchancements, is the rich and royal man."

RALPH WALDO EMERSON

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IN THE INTEREST OF MORE EFFICIENT DATA PROCESSING FOR C.F.I.

Bob McDonald, of Atlanta, Georgia, CFI forester with the U. S. Forest Service in Region 8, has sent us the feature article for this month, and we are very pleased to present it. Encouragement for the use of the most modern data-processing equipment is always good. We are faced this year with machine work involving the advanced computers of 3 different automatic data-processing machine manufacturers.

Continuous Forest Inventory has undergone many interesting changes in Region 8 since its initial acceptance by forest industries years ago. Perhaps the most worthwhile change to date is that concerning data processing.

At the start many foresters were under the impression that once they had their inventory data on punched cards they had it made. All that remained was to load the cards into data processing machines and in a short time the final reports would be ready for top management. This is not the way it works, as those who have processed CFI data well know. At best the job is completed in one or two weeks, sometimes with about half of the job done by hand. When we say this, we are thinking of operations with the ordinary, basic machines commonly found at commercial service bureaus or owned by large industrial businesses and used primarily for fiscal accounting. It is true that CFI involves accounting, but it is concerned with more than listing and tabulating. CFI requires calculations and preferably not at a mere 20 to 100 cards per minute when there are machines capable of processing 200 cards per minute. Region 8 reports that the early model, low-speed machines, while they can be used, are not capable of handling CFI data in the most efficient and business-like manner; that the newer medium or high-speed computers found at many Universities and data processing centers will do the job much faster, cheaper and in a more professional way. Several case history examples support these contentions.

Case History No. 1

This job was completed in 1960 using machine facilities at one of the State Universities. Nine hundred plot cards and 20,000 tree cards were involved. A medium speed computer was used for the calculations. The program 1/ for the processing was written and checked prior to completion of the field work, as it should always be.

1/ A program consists of the instructions stored in the machine's memory drum and needed for processing the data. Special training is required to write programs for computing machines, but this presents no problem, since programmers are available wherever computers are located. Programs were mentioned here so as to avoid confusing them with flow charts and flow plans which are instructions to machine operators.

Arrangements were made at the University to do the processing after school hours. Five men were present -- three foresters who handled the CFI job, a U. S. Forest Service CFI specialist, and an expert machine operator. The entire job was completed in two days at an approximate cost of \$500.00.

Case History No. 2

This example is similar to #1 and the same type of computer was used. The work, however, was done at a different University. Approximately 1,200 plot cards and 25,000 tree cards were processed. In this job, the program was written after the cards were brought to the machine operator. Once the program was completed the data were processed without interruption and with very little hand work.

The program written for this project was unique in that it included written in checks to catch errors of all kinds. Sort checking and sight checking were eliminated. Stock and stand tables for various breaks were compiled in a very short time (approximately one hour) with no hand work or sorting involved! Another outstanding feature of this job was that the original Port-a-Punch field cards were used, and not one card jam in the machine was experienced.

This CFI job took longer and cost more than the first example. There are two reasons for this:

1. More detailed computation was required since numerous and more varied reports were desired.
2. The program was more complex and took longer to write; also, it should have been written before cards were ready to be processed.

The total cost was still considerably less than it would have been using the older standard machines.

Case History No. 3

In the third case the field data were recorded on tally sheets, (we do not encourage this), then key punched into cards. From these cards, the data were transferred onto magnetic tape. This had already been done for the original measurement, and now the remeasurement will be added to the same tape this year. When both measurements are on tape, the data will be processed. Essential reports common to all CFI jobs will be computed, plus a detailed comparison of the two measurements, on a tree by tree basis. This entire job for two measurements will be done in approximately 30 minutes. It is the method of lowest cost. It eliminates much laborious hand work and board wiring, and other tedious jobs associated with the old, standard procedures. It is no longer necessary to have one or two foresters tied up in a machine room for two weeks of work, so why not process your data in this improved manner?

SUMMARY DISCUSSION OF DATA PROCESSING

Under certain conditions low-speed accounting machines are useful for processing CFI data. These conditions, which prevail to only a limited extent in the Southern Region, are as follows:

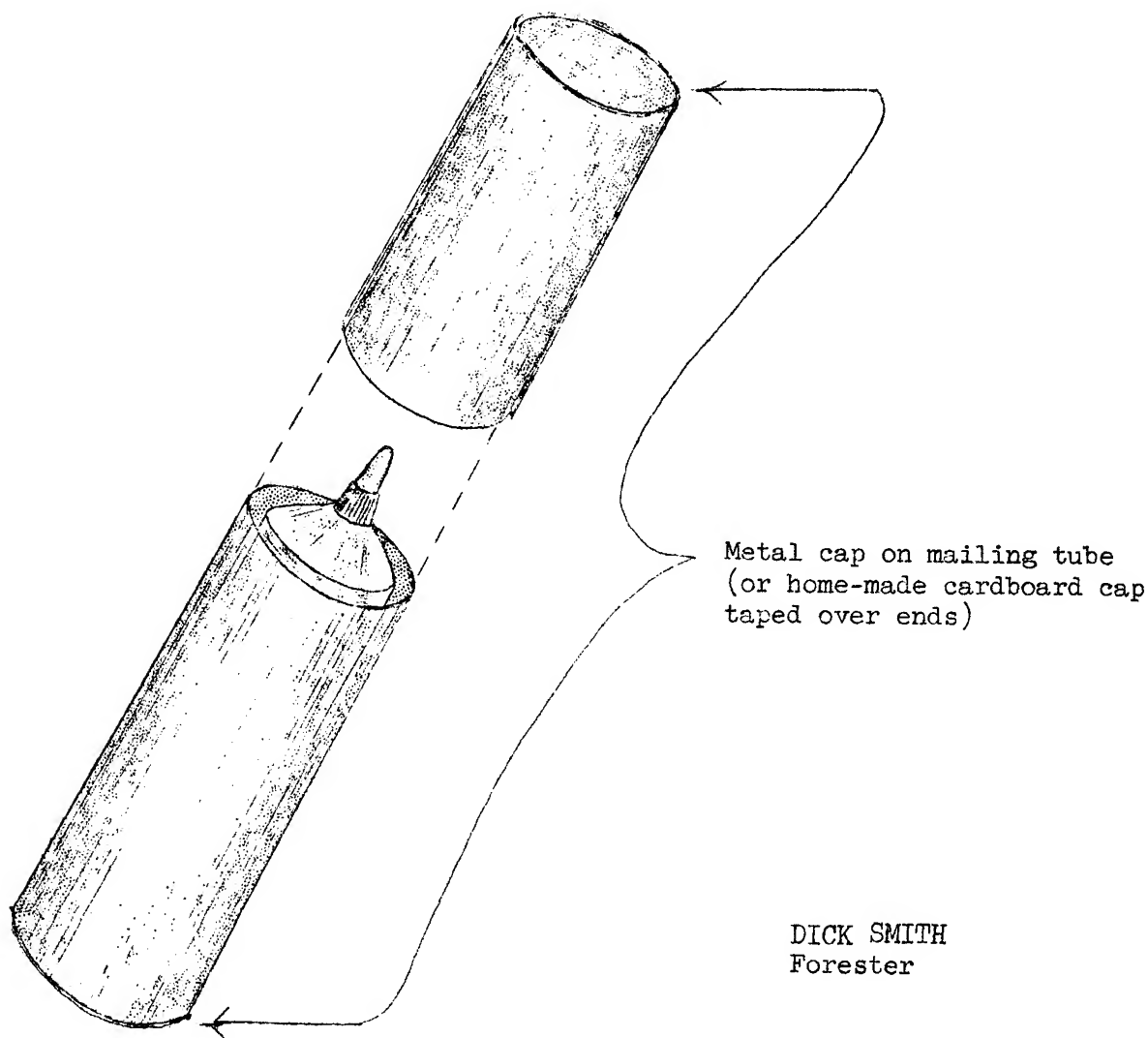
1. Where only low-speed machines are owned or leased by the company doing the work.
2. Where excellent machine operators are available for the low-speed machines in question.
3. Where the machines are readily available at the exact time needed for processing the CFI data.
4. Where Service Bureaus and operators experienced in CFI work are available.

Generally, the data processing can be done better and cheaper with medium and high-speed computers. There are five specific advantages:

1. Machine output is faster.
2. The tedious jobs of check sorting, sorting, reproducing and summary punching are eliminated. All of this work can be done with the computer.
3. Once the written program for the first and subsequent measurements is tested, it can be used for the life of the CFI plot installation.
4. Programs for statistical checks are now available for systematic sampling as well as for random sampling. The formula for systematic sampling works best where the forest has not been radically changed by intensive forest management methods. In either case the volumes can be picked up at four different locations in the IBM card.
5. If the data are put on tape, the storage problem common to individual card records is reduced a great deal.

PAINT TUBES NEED NOT BREAK OR CRACK IN YOUR PACK

Have you had trouble with paint tubes breaking in your pack sack? Phil Jaquith, Division of Timber Management, U. S. Forest Service Regional Office, eliminated this trouble. He devised a carrier from two mailing tubes. One is 2-5/8" inside diameter, and the other about the same outside. Cut to appropriate lengths to fit the paint tube, and with a heavy paper or cardboard cap made for one of the open ends, the two short tubes telescope together snugly and protect the paint tube. (See sketch). The tube may be packed in cotton or rags for still greater protection. The carrier is light, cheap, and appears to be strong enough to stand the gaff for several months.



DICK SMITH
Forester